1989 HERRING FISHERY MANAGEMENT PLAN
NORTON SOUND DISTRICT

(Includes information regarding Port Clarence and Kotzebue Herring Districts)

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[1] The Regional Information Report Series was established in 1987 to provide an information access system for all unpublished divisional reports. These reports frequently serve diverse ad hoc informational purposes or archive basic uninterpreted data. To accommodate needs for up-to-date information, reports in this series may contain preliminary data.

Introduction

This management plan was developed to inform fishermen and processors of strategies that will be employed by the Department of Fish and Game to manage the Norton Sound herring fishery and to provide background regarding the Port Clarence and Kotzebue herring districts. Recent regulation changes are noted and briefly discussed. Also included in this management plan is a review of the status of the Norton Sound fishery and stocks, processor/buyer requirements and a description of Department activities.

Unalakleet will be the base of operations for Department management, research, and enforcement activities within Norton Sound. Field camps will be established at Cape Denbigh, and at Klikitarik, if ice conditions allow. In recent years, the second test fish crew has been mobile. Duties will include aerial biomass assessment surveys, processor registration, catch monitoring, spawn deposition surveys, test fishing, and catch sampling of herring for age, sex, size and maturity information. A daily fleet broadcast will be made at 11:00 a.m. and 6:15 p.m. on SSB 4125, VHF 7 and CB 7 to inform fishermen and processors of current fishery status. Announcements regarding fishery openings and closures will further be broadcast by phone to local villages and AM radio stations (KICY and KNOM). The Unalakleet office will be open daily after May 16 from approximately 8:00 a.m. to 6:00 p.m. with a telephone recorded message after hours providing fishery update information (907-624-3921).

Status of the Fishery

A large scale domestic herring fishery was not initiated in Norton Sound until 1979, although a smaller fishery had occurred sporadically within this area since the early 1900's. The historical catch information is presented in Table 1. During the recent fishery the majority of the harvest has occurred annually between Stuart Island and Cape Denbigh (Figure 1). The estimated biomass and harvest have remained relatively stable since 1981. Biomass estimates have ranged from 17,400 st to 33,924 st; harvests have ranged from 3,933 to 5,294 st.

During recent years the efficiency of the fishing fleet has increased dramatically. Openings have gradually shortened from 10 days during 1981 to less than 12 hours in 1987. This increase in efficiency is due to the increased number of fishermen and more importantly advances in gear technology, i.e., mechanical aids, larger boats, and more efficient nets.

Port Clarence and Kotzebue District:

Until 1987 commercial herring catches from the Port Clarence and Kotzebue districts never totaled more than 10 st (Figure 2). During the 1987 season, 147 st of herring were delivered from the Port Clarence District roughly 2 weeks after the closure of the Norton Sound fishery. Roe condition indicated that the fishery could have occurred as much as 5 days later and yielded a higher value product.

During the 1988 season, a total of 80.0 st were harvested with an average roe percent of 8.2. The bulk of commercial fishery landings occurred on June 11. Gill net fishermen landed 23.6 st with an average roe recovery of 8.9%; purse seiners landed 56.4 st at 7.6% roe recovery. High catches of incidental species complicated fishing operations for both gear types. Incidental species captured included whitefish, starry flounder, tom cod, and char.

Biomass observations in Port Clarence are made difficult by the late breakup and heavy organic coloring of the water. Spotter pilots and fishermen experienced difficulty in distinguishing herring from saffron cod and other nonmarketable species.

The Kotzebue herring stocks have never supported a commercial fishery. It is thought that a fishery there would have similar timing to the Port Clarence fishery and would probably occur in the vicinity of Deering.

Status of Stocks

The arrival of herring on the Norton Sound spawning grounds appears to be greatly influenced by climatological conditions, particularly the extent and distribution of the Bering Sea ice pack. Spawning herring generally appear near the coast soon after ice breakup, sometime in May or early June. The first commercial deliveries made in Norton Sound have ranged from May 18 to June 13, approximately 3 weeks after initiation of the Togiak herring fishery. The primary spawning areas have been from Stuart Island to Tolstoi Point. When sea ice has remained in this area into June, spawning has been more extensive along Cape Denbigh and several locations along the northern shore of Norton Sound between Bald Head and Bluff.

During 1988, the inseason biomass was estimated to be 33,924 st. Projections from 1988 postseason escapement estimates using a schedule of increasing natural mortality with age indicate a returning biomass in 1989 of approximately 21,250 st. Since methods to reliably estimate recruitment have not been developed, returns of ages 3 through 5-year-old herring could increase the 1989 observed biomass over the projected biomass. The 1989 spawning biomass is expected to be dominated by age 7, 8, and 10

year old herring.

During the 1988 season, the peak biomass of 33,924 st was observed on May 25. This peak biomass was observed on a single survey day and was the highest peak and single survey biomass documented in the history of the Norton Sound sac roe fishery. An exploitation rate of 20% could have allowed a commercial harvest of 6,785 st. However, due to the timing of the arrival of the peak biomass and the lack of processing and tendering capacity on the grounds, it was not possible to fully harvest the available surplus. The commercial harvest of 4,672.1 st represented an exploitation of 13.8% of the observed peak biomass.

Management Strategies

The harvest in each district will follow the statewide management policy which sets the maximum exploitation rate at 20% of the estimated biomass of spawning herring. The upper end of the range will be applied to stocks in good condition (large volume, increasing abundance, good recruitment). Smaller stocks or stocks that are exhibiting a trend of decreasing abundance or poor recruitment will be exploited at lower than maximum rates. The quality of the data base, including biomass estimates will be a determinant factor in choosing the appropriate exploitation rates.

The Norton Sound District herring biomass will be harvested at a 20% exploitation rate if inseason aerial biomass surveys and age class composition information indicate the run will achieve at least the preseason projected level (21,250 st). Department personnel will be conducting aerial surveys and sampling age class compositions inseason to obtain current year biomass information. If the run does not materialize as projected, the harvest exploitation rate will be reduced from the maximum level. Since methods to reliably forecast herring returns are still being developed, and estimates of recruitment are not available, harvest levels will be adjusted during the season according to observed biomass and age structure. Harvest should approach 4,250 st (3,825 st by gill nets, 425 st by beach seines).

Herring abundance will be estimated primarily by aerial surveys. Surface area estimates will be made of each school and depending on water depth, a tonnage conversion factor will be assigned. Tonnage conversion factors are determined by capturing schools of herring with known surface areas and weighing the resulting catch. The tonnage conversion data base is updated from research conducted in the Togiak and Norton Sound Districts. There are problems inherent with aerial surveys, and some of these are inclement weather, variable densities and depths of schools, fish school species identification, and multiple school counting. The

Department will monitor test fish catches in order to assess the incidence of other schooling fish in the district.

If inclement weather and water conditions prohibit satisfactory aerial surveys, then stock abundance and condition will be assessed by using a combination of data from test and commercial catches including catch rates, percentage roe recovery, ratios of pre-to post-spawners and relative age class composition. Additional information to assess stock abundance will include spawn deposition observations and projections from 1988 post-season escapement estimates.

Legal fishing gear within the Norton Sound District has been limited to gill nets and beach seines since 1980. Prior to the 1985 season the Alaska Board of Fisheries adopted regulations which: (1) limited beach seine harvest to not more than 10% of the pre-season projected harvest, and (2) closed the district to the commercial harvest of spawn on kelp.

Due to the nature of the herring gill net fishery, significant wastage can occur from unmarketable fish having poor roe recovery. Gill net fishermen can minimize wastage by staying with their nets and fishing only when the herring are carrying a marketable quality of roe. The volume of fish that are discarded (not sold or utilized for subsistence) will be estimated and included in the total harvest. Because of the tendency of previous years' fisheries to have early fishing on unmarketable fish, the Department proposed a regulation that has been put into effect giving the staff authority to open the fishery by emergency order.

Gear Limits:

Several new regulations regarding fishing gear were set at the December 1987 Board of Fisheries meeting. Gillnetters are now limited to 100 fathoms of net and may not carry additional nets during open periods. The Department staff has emergency order authority to further reduce gill net length to 50 fathoms. The management staff does not expect to reduce the gill net limit to 50 fathoms unless (1) the remaining harvest is so small that the fishing fleet operating 100 fathom gear compliments would over harvest the resource, or (2) if a test fishery is needed to test roe quality or if the feasibility of fishing in ice choked waters becomes limited. An additional new regulation adopted in 1987 limited beach seine gear to 75 fathoms in length.

Fishing Season - Periods:

The commercial herring fishery will open by emergency order. This year roe quality will be monitored initially by ADF&G field crews at Cape Denbigh and Unalakleet. As the herring approach marketable ripeness (8.5% roe recovery) ADF&G will organize daily

"beach parties". These "beach parties" are intended to provide a public forum where fishermen, buyers and biologists can evaluate the progress of herring maturity and reach a common decision on the marketability of the resource. Ideally these "beach parties" will begin several days before the first opening.

In order to accurately evaluate the whole District's herring resource it may be necessary to find a central location to hold the "beach parties". Since herring usually ripen first in the southern subdistricts, St. Michael, Klikitarik, and Unalakleet as well as Cape Denbigh will all be considered as possible sites. Final selection of the beach party site will depend on biomass observations and the number of potential participants.

The fishery will open once the herring are judged marketable or when significant spawn is observed. Fishing period length will depend on (1) fleet size, (2) biomass distribution, (3) and the timeliness of catch reporting. The fishery will close when 20% of the herring biomass is judged to have been harvested.

Several subdistricts will probably be opened simultaneously. However, subdistricts may be closed independently of each other to prevent overharvesting if herring biomass distribution and harvest rates make such action necessary. A difference in the timing of spawn could also cause the southern subdistricts to close before the northern subdistricts. Beach seine fishing periods may be reduced in length or established separately from gill net fishing periods to provide the Department the opportunity to closely monitor the harvest rate and gain accurate catch reports.

Table 1. Commercial herring fishery summary information, Norton Sound District, 1979 - 1988.

	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
Est. Biomass (st)	7,700	8,400	25,100	17,400	28,100	23,100	20,000	28,100	32,370	33,924
Catch (st)										
Gill net	380	2,415	4,371	3,933	4,541	3,245	3,379	4,979	3,465	4,064
Beach seine	912 1/	37	0	0	41	327	169	215	314	191
No. of fishermen	67	294	332	237	272	194	277	323	563	348
No. of buyers	7	8	13	7	9	8	11	10	11	11
Avg. roe %	7.0	8.1	8.8	8.8	8.6	10.3	9.9	9.6	8.6	9.0
Peak catch day	5/24	5/30	5/24	6/8	5/23	6/10	6/20	6/9	6/7	5/28
Fishery duration	5/19 -6/14	5/21 -6/6	5/18 -5/28	6/3 -6/11	5/18 -5/28	6/6 -6/12	6/13 -6/21	6/3 -6/10	6/7 -6/8	5/27 5/31

1/ Purse seine harvest.

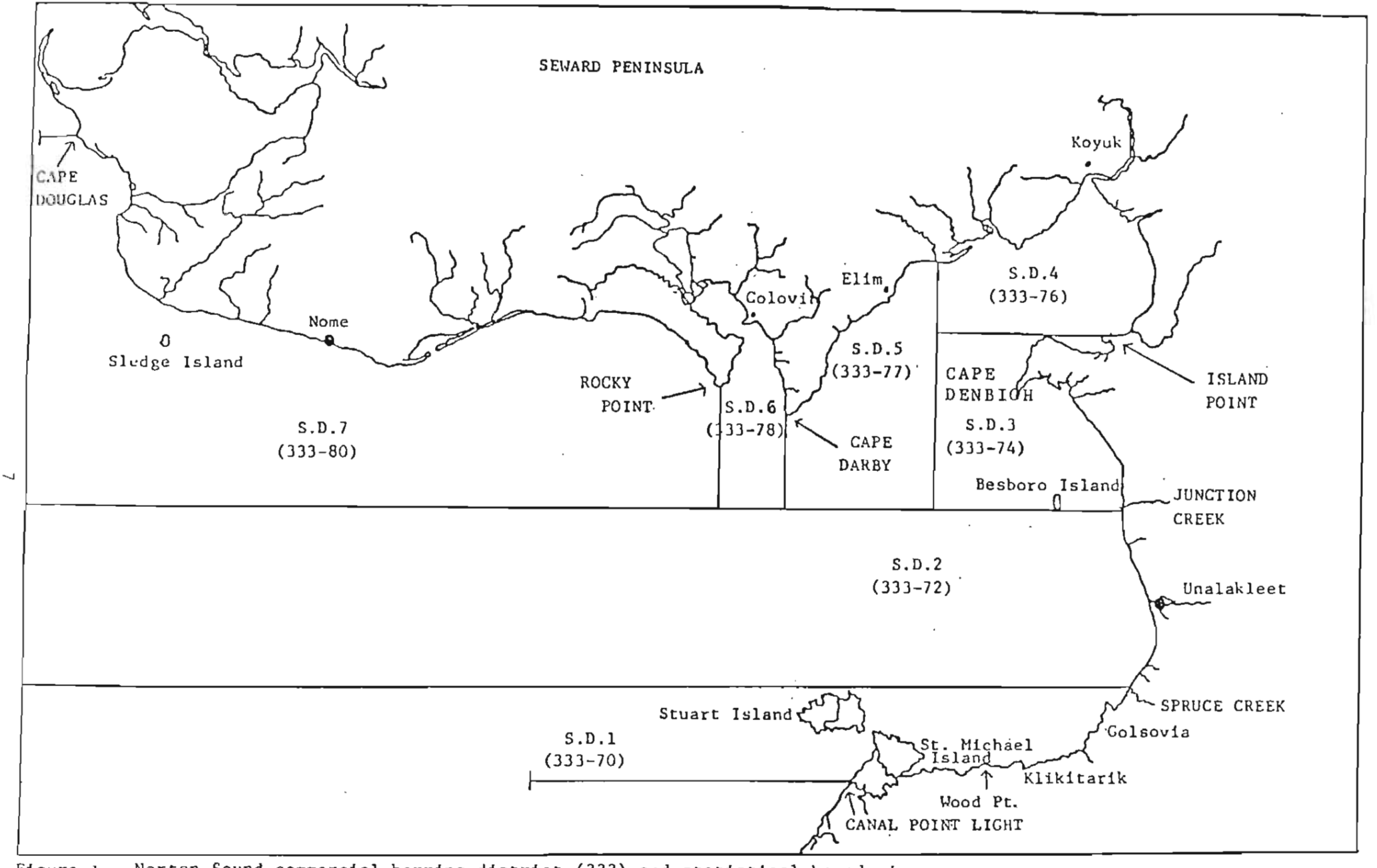

Figure 1. Norton Sound commercial herring district (333) and statistical boundaries.

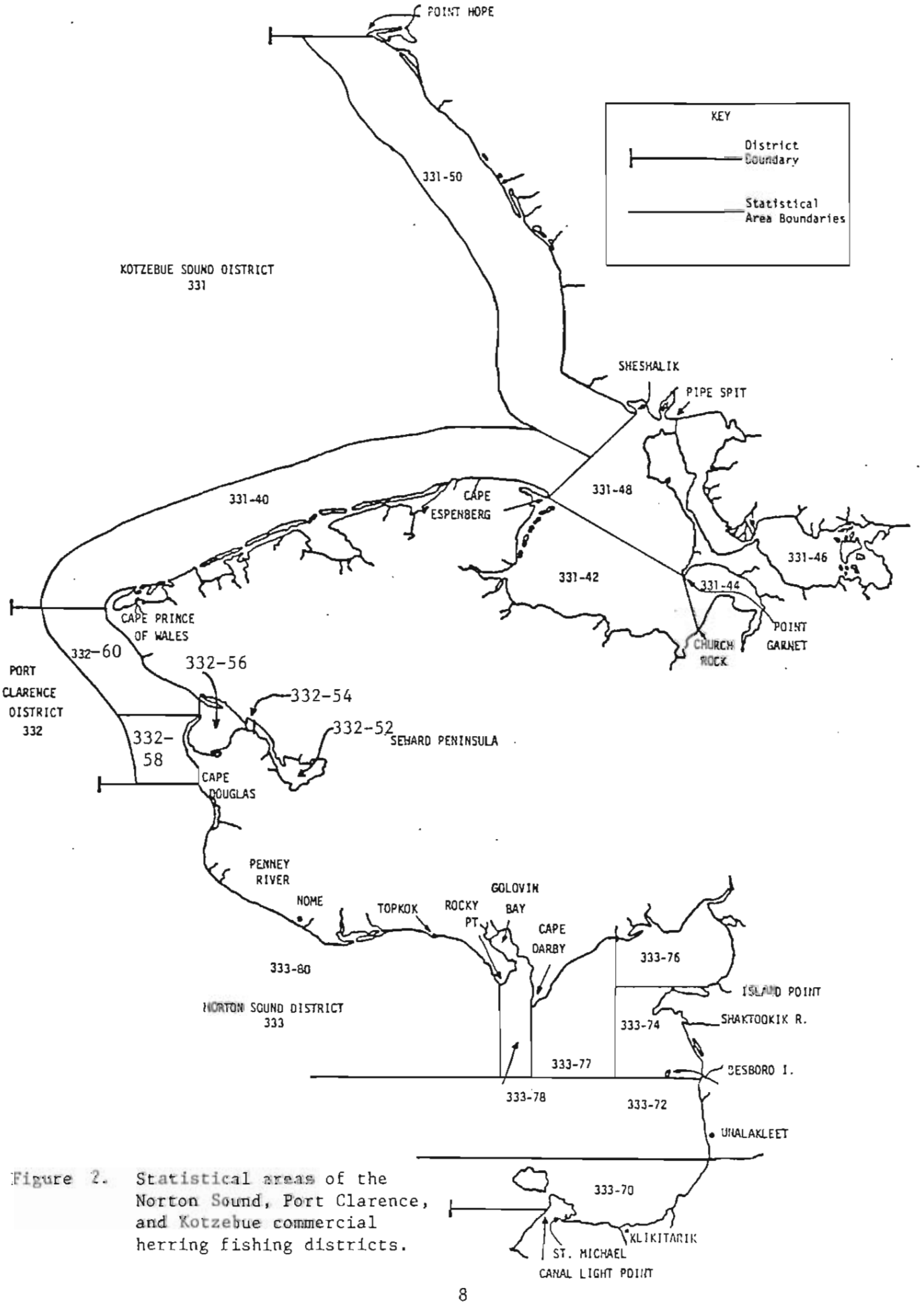

Figure 2. Statistical areas of the Norton Sound, Port Clarence, and Kotzebue commercial herring fishing districts.